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# Rough Rice as Feed for Horses and Mules.

BY W. H. DALRYMPLE.

The Veterinary Department of the Experiment Stations has received requests, from time to time, to give an opinion with respect to the suitability and safety of rough rice as a feed for horses and mules.

The Department has been aware that in the rice-growing section of the State, viz., Southwestern Louisiana, rough rice has been used as feed, yet we were not in possession of any accurate or intelligent data concerning its physical effect upon the digestive organs; and it would seem that the prevailing opinion, or impression, of a possible deleterious physical effect has been based upon the presence of the somewhat silicious nature of the hull enclosing the rice kernel.

Considering the fact that, at times, when other cereal grains used as horse and mule feed, such as oats, corn, etc., are high in price, and the cost of rice low, in the producing sections, it was thought the latter might, by intelligent use, become of considerable economic value as a feed in those sections, or, indeed, outside of them.

Again, in looking a little more closely into the matter of crude fibre content, we could not quite see why rough rice, with an average crude fibre analysis of 9.3 per cent. should be any more dangerous to feed, or affect the digestive organs of the animal more injuriously, than a rice bran containing 15 per cent. of rice hulls, and showing an analysis of 14.5 per cent. of crude fibre, which, in reality, indicates a much higher content of crude fibre than is contained in the rice grain itself.

In April last the Veterinary Department of the Stations, at Baton Rouge, determined to conduct a test, using two of the work mules, in order to obtain some accurate information on the subject for the benefit of those seeking such data in the future, and to be able to either verify or contradict an, apparently, prevalent impression that rough rice is injurious when fed to horses and mules.

Through the Rice Experiment Station, at Crowley, La., this Department procured five sacks of ground rough rice for the test. Rations for the two mules were compounded, gradually increasing the amount of rice at intervals until 8 pounds, or a little over, were fed to each mule per day.

This gradual increase in the rice ingredient of the ration was decided upon as a matter of caution, and to watch the deleterious effect, if any, during the progress of the test.

The ration was balanced to meet the requirements of a mule weighing 1,000 pounds and doing medium, or moderately heavy work, per day, and was composed of rough rice (ground), cracked corn, cotton seed meal, cane molasses (blackstrap), and lespedeza hay. As the rice in the ration was increased, the cracked corn was decreased, until 8 pounds of rice were fed, without any corn. The other ingredients remained the same in quantity.

The initial ration, for one day, contained the following:

| | | | Digestible | | |
|---|---|---|---|---|---|
| | | Dry Matter. | Protein. | Carbohydrates. | Fat. |
| Lbs. | | Lbs. | Lbs. | Lbs. | Lbs. |
| 2 | Rough rice (ground) | 1.70 | 0.09 | 1.20 | 0.06 |
| 6 | Cracked corn | 5.36 | 0.47 | 4.00 | 0.25 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses (blackstrap) | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 22.24 | 2.08 | 13.13 | 0.73 |

Nutritive Ratio, 1:7.0

It should be here stated that although the above and all the subsequent rations, was based upon 12 pounds of lespedeza hay as roughage, the animals received only a moderate amount of grazing when turned out at night. Also, that each day's concentrated part of the ration was divided into three parts. On Sundays the mules received only morning and night feeds and were allowed to graze during the day.

Further, so far as we are aware, no digestion expriments have been conducted with rough rice to ascertain the digestion co-efficients, or percentage digestibility, of its crude protein, carbohydrates and fat.

By reference to any published table showing the percentage composition of rough rice and corn and cob meal, however, it will be found that the composition of the latter is sufficiently approximate to that of the former to enable us to apply, for all practical purposes, the percentage digestibility of corn and cob meal to the rough rice, which we have done in the conduct of this test, and with apparently satisfactory results.

On April 25th, 1910, two aged mules, which we shall name, respectively, "Bet," weighing 815 pounds, and "Mack," weighing 940 pounds, were given the initial ration shown above. "Mack," being rather fastidious in his taste, declined to eat the mixture, which was quite a change from his previous feed, and on May 2d a much younger mule, "Rhoda," weighing 1,155 pounds, was substituted, and she and "Bet" continued the test mules throughout the experiment.

WEIGHT AND CONDITION OF MULES.

| May 2. | Lbs. | Condition. |
|---|---|---|
| "Bet" | 820 | Improved |
| "Rhoda" | 1,155 | Good |

MAY 6. SECOND RATION.

| Lbs. | | Dry Matter. Lbs. | Digestible: Protein. Lbs. | Digestible: Carbohydrates. Lbs. | Digestible: Fat. Lbs. |
|---|---|---|---|---|---|
| 4 | Rough rice | 3.96 | 0.18 | 2.40 | 0.12 |
| 4 | Cracked corn | 3.58 | 0.31 | 2.67 | 0.17 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 22.72 | 2.01 | 13.00 | 0.71 |

Nutritive Ratio 1:7.2 plus.

| May 17. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 825 | Improved |
| "Rhoda" | 1,154 | Good—stationary |

MAY 17. THIRD RATION.

| Lbs. | | Dry Matter. Lbs. | Digestible: Protein. Lbs. | Digestible: Carbohydrates. Lbs. | Digestible: Fat. Lbs. |
|---|---|---|---|---|---|
| 5 | Rough rice | 4.24 | 0.22 | 3.00 | 0.12 |
| 3 | Cracked corn | 2.68 | 0.23 | 2.00 | 0.13 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 22.10 | 1.97 | 12.93 | 0.67 |

Nutritive ratio, 1:7.3 plus.

| May 25. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 826 | Improved |
| "Rhoda" | 1,152 | Good—stationary |

MAY 26. FOURTH RATION.

| Lbs. | | Dry Matter. | Digestible Protein. | Digestible Carbohydrates. | Digestible Fat. |
|---|---|---|---|---|---|
| | | Lbs. | Lbs. | Lbs. | Lbs. |
| 6 | Rough rice | 5.00 | 0.26 | 3.60 | 0.17 |
| 2 | Cracked corn | 1.79 | 0.16 | 1.34 | 0.08 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 22.06 | 1.94 | 12.87 | 0.67 |

Nutritive ratio, 1:7.3 plus.

| May 31. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 832 | Improved |
| "Rhoda" | 1,150 | Good. Slightly off feed |

JUNE 1. FIFTH RATION.

| Lbs. | | Dry Matter. | Digestible Protein. | Digestible Carbohydrates. | Digestible Fat. |
|---|---|---|---|---|---|
| | | Lbs. | Lbs. | Lbs. | Lbs. |
| 7 | Rough rice | 5.94 | 0.31 | 4.20 | 0.20 |
| 1 | Cracked corn | 0.89 | 0.08 | 0.67 | 0.04 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 22.01 | 1.91 | 12.80 | 0.66 |

Nutritive ratio, 1:7.5

| June 7. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 825 | Good. Slightly off feed |
| "Rhoda" | 1,155 | Improved |

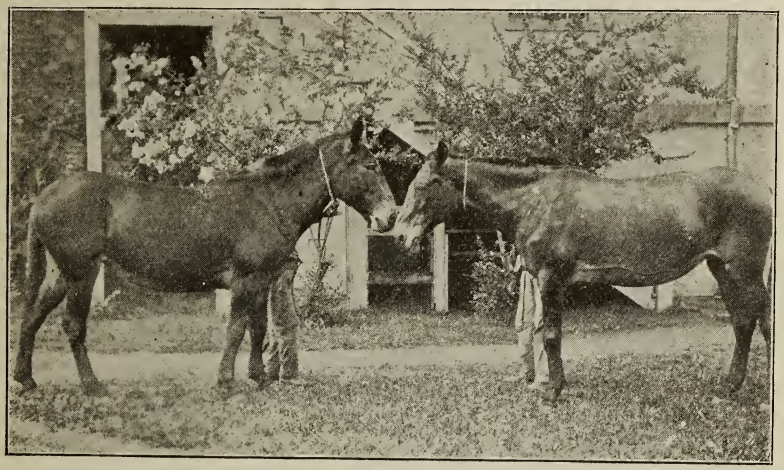
JUNE 7. SIXTH RATION.

| Lbs. | | Dry Matter. | Digestible Protein. | Digestible Carbohydrates. | Digestible Fat. |
|---|---|---|---|---|---|
| | | Lbs. | Lbs. | Lbs. | Lbs. |
| 8 | Rough rice | 6.79 | 0.35 | 4.80 | 0.23 |
| 1½ | Cotton seed meal | 1.38 | 0.56 | 0.25 | 0.18 |
| 4 | Molasses | 3.12 | 0.00 | 2.64 | 0.00 |
| 12 | Lespedeza hay | 10.68 | 0.96 | 5.04 | 0.24 |
| | | 21.97 | 1.87 | 12.73 | 0.65 |

Nutritive ratio, 1:7.6

| June 25. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 828 | Improved |
| "Rhoda" | 1,150 | Good—work, harder; weather hot. |

The sixth ration was continued until the end of the test, June 30th, when the two mules had practically consumed the five sacks of rice, with the slight exception that the larger mule,



"RHODA." "BET."

(Photos taken on completion of test.)

"Rhoda," on account of her greater weight, was given, commencing June 10th, 1 lb. more of the rice and cotton seed meal mixture than the smaller mule.

| June 30. | Weight. Lbs. | Condition. |
|---|---|---|
| "Bet" | 851 | Improved |
| "Rhoda" | 1,155 | Improved |

## CONCLUSIONS.

The size of the ration employed was more suited to the requirements of the lighter mule than of the heavier one, although the latter seemed to maintain her weight on it. Had the specified amount of hay (12 pounds) in the ration been consumed, instead of only moderate grazing as roughage, the heavier mule might, probably, have increased her weight.

The general health and condition of both mules were excellent throughout the test, with the exception of one or two "off days" due to hot weather. In fact, the mule "Bet," which has been on the Station for in the neighborhood of fifteen years, has never been known to be in such regularly good and uniform physical condition. The mule "Rhoda" was a comparatively recent purchase.

Rough rice, when ground, and forming one of the ingredients of a mixed ration, may be fed with safety and benefit to horses or mules.

The day's ration may be composed of at least 8 pounds of ground rough rice for horses or mules doing moderately heavy work and approximating 1,000 pounds live weight.

The other ingredients in the test rations proved suitable to mix with the ground rough rice, although other available materials, if of the required composition to balance the ration, might be just as satisfactory.

When the prices of other cereal (feeding) grains are high, etc., and other conditions warrant, ground rough rice may be found of considerable economic value as a feed for horses or mules, if intelligently and systematically used.